

AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1 1. (Currently Amended) A method for using query signatures to provide
2 ~~security for a database~~ detect structured query language (SQL) injection,
3 comprising:
4 initializing a signature cache, wherein initializing the signature cache
5 involves:
6 trapping database queries in a controlled environment,
7 parsing the database queries to produce a set of valid signatures,
8 wherein parsing the database queries involves determining signatures for
9 the queries, wherein the signature ~~specifies a structure based on operations~~
10 ~~for the query and is independent of the value of literals in the query~~ SQL
11 ~~keywords contained in the corresponding query with literals removed,~~ and
12 storing the valid signatures in the signature cache;
13 receiving a query at the database;
14 parsing the query at the database to determine a signature for the query,
15 wherein the signature comprises SQL keywords contained in the corresponding
16 ~~query with literals removed~~ specifies a structure based on operations for the query
17 ~~and is independent of the value of literals in the query and wherein the signature is~~
18 ~~constructed from structured query language (SQL) keywords of the query;~~
19 determining if the signature is located in the signature cache, which
20 contains signatures for valid queries; and

21 if so, processing the query, otherwise, ~~triggering a mismatch~~
22 ~~alert~~identifying the query as being SQL injected and rejecting the query.

1 2. (Cancelled)

1 3. (Previously Presented) The method of claim 1, wherein the mismatch
2 alert throws an error.

1 4. (Previously Presented) The method of claim 1, wherein the mismatch
2 alert is sent to a database administrator and the query is processed.

1 5. (Previously Presented) The method of claim 1, wherein the mismatch
2 alert is sent to a requesting application, thereby allowing the requesting
3 application to take action.

1 6. (Cancelled)

1 7. (Original) The method of claim 1, wherein if the signature generates a
2 mismatch alert and if the query is a valid query, the method further comprises
3 allowing a database administrator to add the signature to the signature cache.

1 8. (Currently Amended) A computer-readable storage medium storing
2 instructions that when executed by a computer cause the computer to perform a
3 method for using query signatures to ~~provide security for a database~~detect SQL
4 injection, wherein the computer-readable storage medium includes magnetic and
5 optical storage devices, disk drives, magnetic tape, CDs (compact discs), and
6 DVDs (digital versatile discs or digital video discs), the method comprising:

7 initializing a signature cache, wherein initializing the signature cache
8 involves:
9 trapping database queries in a controlled environment,
10 parsing the database queries to produce a set of valid signatures,
11 wherein parsing the database queries involves determining signatures for
12 the queries, wherein the signature comprises SQL keywords contained in
13 the corresponding query with literals removed~~specifies a structure-based~~
14 ~~on operations for the query and is independent of the value of literals in~~
15 ~~the query, and~~
16 storing the valid signatures in the signature cache;
17 receiving a query at the database;
18 parsing the query at the database to determine a signature for the query,
19 wherein the signature comprises SQL keywords contained in the corresponding
20 query with literals removed~~specifies a structure-based on operations for the query~~
21 ~~and is independent of the value of literals in the query and wherein the signature is~~
22 ~~constructed from structured query language (SQL) keywords of the query;~~
23 determining if the signature is located in the signature cache, which
24 contains signatures for valid queries; and
25 if so, processing the query, otherwise, identifying the query as being SQL
26 injected and rejecting the query triggering a mismatch alert.

1 9. (Cancelled)

1 10. (Previously Presented) The computer-readable storage medium of
2 claim 8, wherein the mismatch alert throws an error.

1 11. (Previously Presented) The computer-readable storage medium of
2 claim 8, wherein the mismatch alert is sent to a database administrator and the
3 query is processed.

1 12. (Previously Presented) The computer-readable storage medium of
2 claim 8, wherein the mismatch alert is sent to a requesting application, thereby
3 allowing the requesting application to take action.

1 13. (Cancelled)

1 14. (Original) The computer-readable storage medium of claim 8, wherein
2 if the signature generates a mismatch alert and if the query is a valid query, the
3 method further comprises allowing a database administrator to add the signature
4 to the signature cache.

1 15. (Currently Amended) An apparatus for using query signatures to detect
2 SQL injection~~provide security for a database~~, comprising:
3 an initialization mechanism configured to initialize a signature cache,
4 wherein when initializing the signature cache, the mechanism is configured to:
5 trap database queries in a controlled environment,
6 parse the database queries to produce a set of valid signatures,
7 wherein parsing the database queries involves determining signatures for
8 the queries, wherein the signature ~~specifies a structure-based on operations~~
9 ~~for the query and is independent of the value of literals in the~~
10 query comprises SQL keywords contained in the corresponding query with
11 literals removed, and
12 store the valid signatures in the signature cache;
13 a receiving mechanism configured to receive a query at the database;

14 a parsing mechanism configured to parse the query at the database to
15 determine a signature for the query, wherein the signature comprises SQL
16 keywords contained in the corresponding query with literals removed~~specifies a~~
17 ~~structure based on operations for the query and is independent of the value of~~
18 ~~literals in the query and wherein the signature is constructed from structured query~~
19 ~~language (SQL) keywords of the query;~~
20 a matching mechanism configured to determine if the signature is located
21 in the signature cache, which contains signatures for valid queries;
22 a processing mechanism configured to process the query if the signature is
23 located in the signature cache; and
24 an alerting mechanism configured to identify the query as being SQL
25 injected and rejecting the query~~trigger a mismatch alert~~ if the signature is not
26 located in the signature cache.

1 16. (Cancelled)

1 17. (Previously Presented) The apparatus of claim 15, wherein the
2 mismatch alert throws an error.

1 18. (Previously Presented) The apparatus of claim 15, wherein the
2 mismatch alert is sent to a database administrator and the query is processed.

1 19. (Previously Presented) The apparatus of claim 15, wherein the
2 mismatch alert is sent to a requesting application, thereby allowing the requesting
3 application to take action.

1 20. (Cancelled)

1 21. (Original) The apparatus of claim 15, further comprising an adding
2 mechanism configured to allow a database administrator to add the signature to
3 the signature cache if the signature generates a mismatch alert and if the query is a
4 valid query.